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## HABITAT NOTES AND DESCRIPTION OF THE LARVA OF *CICINDELA CIRCUMPICTA JOHNSONI* FITCH (CICINDELIDAE)<sup>1</sup>

By PAUL J. SPANGLER<sup>2</sup>

Today, although most entomologists would find it difficult to discover a new species of insect in their back yard, the chances of finding an undescribed larval form would be very good.

It is evident when one examines the literature on descriptions of immature insects, that much work remains to be done in this field. In the family Cicindelidae, where adult taxonomy has progressed rapidly, one still finds a dearth of larval descriptions. This is true in most groups of insects. I mention this with the hope that it will interest others to work in the grossly neglected field of immature taxonomy.

Salt springs are scarce and widely scattered in Missouri. Since these areas and many of the insects associated with them are unusual, an entomological survey of a few of these springs was initiated to determine whether any halophilic forms were present.

During a survey of the historical Boone's Lick Salt Spring area located three miles north of Petersburg, Howard County, Missouri, adults of *Cicindela circumpecta johnsoni* Fitch were found. The flats around the salt springs were literally alive with these handsome beetles.

Numerous adult *Cicindela circumpecta johnsoni* were caught in flight by sweeping with an aerial net. No adults of the subspecies *C. c. salinae* Vaurie were seen. A few *Cicindela repanda* Dej., were the only other tiger beetles collected in the area.

Examination of the ground showed typical burrows of cicindelid larvae. Due to the abundance of the adults, these burrows were suspected to

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be those of *Cincindela circumpicta johnsoni* Fitch. A number of burrows were excavated and larvae were collected for study. The burrows were nearly vertical and extended from six to twelve inches into the soil. The majority of burrows were located along the periphery of the salt flats but many were also scattered about over the inner area.

The larvae which were collected were compared with descriptions of known larvae, and they proved to be different than any of those described. Examination and comparisons with the immature forms of *C. repanda* Dej. eliminated the possibility that these larvae belonged to the latter species. From this evidence then, it is assumed that these immature insects are the larvae of *C. c. johnsoni* Fitch.

Larvae will be deposited in the following institutions: U. S. National Museum, American Museum of Natural History, California Academy of Sciences and the University of Missouri Entomological Museum.

Although this beetle has been previously reported from the state by Vaurie (1951) it is not common in the state, and it should be noted that it occurs at two additional salt springs. One of these is located one mile west of Rocheport, in Howard County, Missouri, south of U. S. Highway 40, and the other, one and one-half miles east of Rocheport, in Boone County, on the north side of the same highway. Examination of other saline areas in the state might provide us with additional records.

#### LARVAL DESCRIPTION

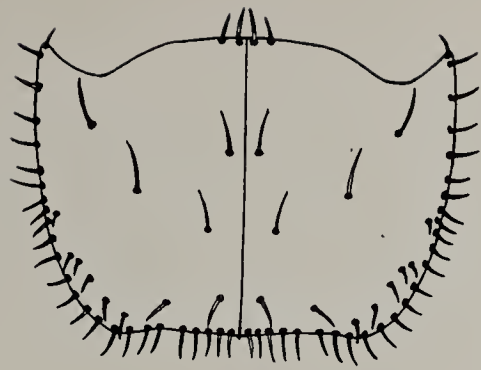
*Color.*—Head black with blue-green reflection; pronotal margins testaceous, disk of pronotum castaneous; mesonotum fuscous anteriorly, testaceous posteriorly; metanotum testaceous; antennae testaceous except fuscous ultimate segment; mandibles with retinaculum and apices piceous, bases rufo-testaceous; maxillae and labium testaceous; legs testaceous except elongate fuscous spot laterally on coxae, apices of tarsal claws piceous. Setae on dorsum of head and pronotum glassy, the remaining setae testaceous.

*Measurements.*—Length of fully extended larvae from apices of closed mandibles to end of pygopod 17 to 21 mm.; width at third abdominal segment 2 mm.; diameter of ocellus II, 0.40 mm.; distance between ocellus I and ocellus II, 0.30 mm.; diameter of ocellus I, 0.35 mm.; length of fronto-clypeo-labial area 1.70 mm.; width 1.80 mm.; length of pronotum on midline 2.10 mm.; width 3.40 mm.

*Head.*—Setae on dorsum conspicuous; ocellus II subequal to ocellus I, distance between ocellus I and ocellus II about equal to width of ocellus II; fronto-clypeo-labral area slightly wider than long; U-shaped ridge on the caudal part of frons with two setae; antennae with ultimate segment half as long as penultimate, ultimate segment with 3 setae, penulti-



HEAD - DORSAL VIEW



PRONOTUM - DORSAL VIEW



LABIUM - VENTRAL VIEW



MAXILLA - VENTRAL VIEW



MAXILLA - DORSAL VIEW



ANTENNA - DORSAL VIEW



RIGHT MANDIBLE  
VENTRAL VIEW



RIGHT MANDIBLE  
DORSAL VIEW



3rd ABD. SEGMENT  
LATERAL VIEW



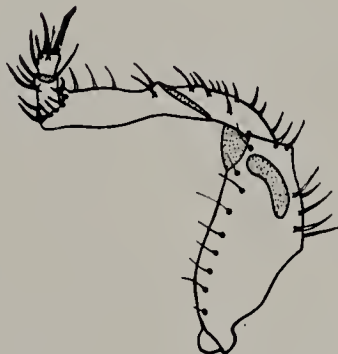
LABRUM - DORSAL VIEW



5th ABD. SEGMENT  
DORSAL VIEW



PROTHORACIC LEG  
CEPHALIC ASPECT



MESOTHORACIC LEG  
CEPHALIC ASPECT



METATHORACIC LEG  
CEPHALIC ASPECT

P.J.

mate with 3 to 4; maxillae with ultimate segment of each galea with 5 setae; maxillary palpus three segmented, ultimate segment longer than penultimate, penultimate with 2 setae; antepenultimate shortest of all and without setae, palpifer with 7 strong spines; ligula with 4 fine setae arranged in a transverse row at ventro-distal end, ultimate segment of labial palpus with 1 spine ventro-medially, penultimate segment with 3 spur-like projections on ventro-distal margin and with 2 setae on each side of projections.

*Thorax*.—Pronotum with cephalo-lateral margins extending as far cephalad as mesal portion, primary setae 6, large and glassy in appearance.

*Abdomen*.—Sclerotized areas distinct, setae yellowish brown; caudal margin of ninth abdominal sternum bearing two groups of 3 strong setae each; pygopod with a ventral ring of fourteen strong setae; inner hooks on fifth abdominal segment with 6 to 8 setae each; the spine-like projection obsolete; median hooks with 2 strong and 2 or 3 weak setae.

This species runs to couplet 24 in Hamilton's (1925) key. It can be separated from *abdominalis* and *marginata* by the following key:

1. Ligula with 4 fine setae but not arranged in transverse row at ventro-distal end, the median two setae caudad of lateral setae; ultimate segment of the antennae with 7 or 8 setae; inner hooks on dorsum of fifth abdominal segment with 3 prominent setae ..... **abdominalis**
- Ligula with 4 fine setae arranged in a transverse row at ventro-distal end..... **2**
2. Ultimate segment of antennae with 9 or 10 setae, penultimate with 9 or 10 setae; proximal segment of galea with 3 setae; inner hooks on dorsum of fifth abdominal segment with 10 or 11 prominent setae, median hooks with 3 setae each..... **marginata**
- Ultimate segment of antenna with 2 to 4 setae, penultimate with 3 to 4 setae; proximal segment of galea with 5 setae; inner hooks on dorsum of fifth abdominal segment with 5 to 7 prominent setae, median hooks with 4 or 5 setae each..... **circumpicta johnsoni**

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